

COVERING MADE OF FORM-RETAINING PARTS, IN PARTICULAR FOR A  
FLOOR, COVERING PARTS FOR USE THEREIN AND METHOD FOR  
CONNECTING THE COVERING PARTS

The invention relates to a covering for arranging on  
a ground surface, in particular a floor, comprising:

at least two parallel form-retaining covering parts  
which are mutually connected along adjacent side edges and  
5 which have a backing side directed toward the ground surface  
and a visual side remote therefrom, wherein the two side  
edges take a step-like form with an inner and an outer edge  
segment such that the first covering part has a protruding  
backing side and the second covering part has an overhanging  
10 visual side,

which covering parts are provided with co-acting  
coupling elements placed along the side edges, wherein the  
coupling element of the first covering part is a groove which  
is formed in the protruding backing side and at least open to  
15 the visual side, and the coupling element of the second  
covering part forms a tongue extending from the overhanging  
visual side at least to the ground surface, which groove and  
tongue each have an at least partly curved profile, and  
wherein the groove undercuts the inner edge segment of the  
20 first covering part and the tongue protrudes beyond the outer  
edge segment of the second covering part.

Such a floor covering, which is for instance known  
from DE-U-20300306, is marketed in diverse variants by  
different suppliers, and is known under the collective name  
25 of "snap laminate".

The snap laminate described in DE-U-20300306 consists  
of elongate strips or planks of a laminated material. This

material comprises a relatively thick base layer, the actual plank, of an inexpensive and easily processable board material, such as medium density fibreboard (MDF) or high density fibreboard (HDF), on which is arranged a relatively thin top layer of a decorative material, for instance paper printed with a wood design. This top layer is made wear-resistant by treatment with suitable synthetic resin. The visual side of the laminate thus has the appearance of natural wood but, because the laminate can be manufactured industrially, it costs considerably less.

Snap laminate is intended mainly for laying by the DIY enthusiast. It must therefore be possible for laying to take place in simple manner and with a minimum of tools. To this end the planks of the known snap laminate have a groove in one of the long sides, while the opposite long side is provided with a tongue which co-acts therewith. The groove is bounded at the top and bottom by a lip, wherein the lip on the bottom side protrudes further than on the top side. In similar manner the tongue protrudes further from the bottom side than from the top side of the plank.

Two types of tongue and groove connection are shown in DE-U-20300306, form-fitting and force-transmitting.

In the first variant of the laminate, as shown in fig. 4, the tongue and groove have, in each case together with adjoining parts of the side edge, complementary profiles which fit together without clearance. The tongue and groove are herein each provided with a curved profile. As stated, the groove undercuts the visual side of the plank, while the tongue protrudes outside the side edge thereof. The undercut and the protruding part of the tongue likewise have a curved profile. Adjoining planks are connected to each other by inserting the tongue of the one plank at an angle into the groove of the other plank and then placing the planks again

in one plane. Here the different curved profiles together define the form-fitting connection between the planks.

In the second variant, the actual snap laminate, which is shown for instance in fig. 2 of this older

5 publication, the lower lip takes a thin form such that it is resiliently flexible. This lip is provided on its end with a relatively low upright snap edge. In similar manner the tongue is provided on its underside with a low protruding snap edge which engages behind the snap edge of the lower lip  
10 when two planks are connected on their side edges. As a result of the resiliently flexible character of the lower lip, the planks can be connected by sliding them against each other parallel to their plane and then pressing with some force until the lower lip bends out so far that the snap edge  
15 of the tongue slides over the snap edge of the lip and fall therebehind. The planks are thus snapped together.

Similar connecting systems are provided on the end surface edges of the planks, whereby a plurality of planks can be laid mutually in line.

20 The known snap laminate has a number of drawbacks. The thin, resiliently flexible lower lip, which protrudes outside the end edge of the plank, is thus relatively vulnerable during transport, whereby there is the risk of damage which makes later connection of the planks more  
25 difficult. Furthermore, once the snap connection has been formed, it can only be released again with great effort, wherein there is considerable danger of damage to the lower lip then still occurring. In the case of for instance moving house, it is therefore not readily possible to take up the  
30 snap laminate floor once it has been laid. The principle of the snap connection further entails that it is always under tension, wherein the dimensioning is of great importance. The planks must therefore be laid without clearance and under

tension, whereby after connection they cannot be displaced parallel to each other, or only with great difficulty. A lubricant often has to be applied for this purpose in practice between the tongue and the groove, whereby the  
5 number of operations increases, as well as the cost. The material used must moreover remain free of expansion or warping under the influence of temperature and humidity.

The variant of the known laminate with the form-fitting connection has the drawback of being difficult to  
10 manufacture as a consequence of the large number of curved surfaces. The tip of the tongue is moreover relatively thin, whereby it is vulnerable. The corresponding angle of the tongue is relatively narrow, whereby sawdust will soon accumulate there which will interfere with the fit of the  
15 profiles. Finally, owing to the curved progression of the protruding part of the tongue and the undercut, a clear abutting surface is lacking, whereby accurate placing of the planks against each other is made more difficult.

Other drawbacks of the known laminate are that in the  
20 form-fitting variant of the connection the profiles of the side edges are embodied such that nowhere is any gap formed. Expansion or contraction of the base layer, as a consequence of variations in for instance the air humidity or temperature, will immediately result in deformation of the  
25 whole floor covering. As a result of the use of printed paper or veneer as top layer, the known laminate further has a cheap or low-quality appearance, while wear of this thin top layer immediately results in the base layer becoming visible.

The invention therefore has for its object to provide  
30 a covering of the above stated type, wherein these drawbacks do not occur. According to a first aspect of the invention this is achieved in that the undercut of the groove and the part of the tongue protruding beyond the edge each have an at

least partly chamfered profile. By making use of oblique profiles instead of curved profiles for the undercut and the protruding part of the tongue, a less vulnerable profile is obtained which furthermore defines clear abutting surfaces.

5           A subsequent covering part can be connected to an already laid part of the covering by simply lowering it from above into the groove with its tongue at an angle and then rotating it back until the chamfered profile parts rest against each other. No great forces need be applied here to  
10   deform one of the two parts. In the fitted position the covering parts are therefore still slidable relative to each other parallel to the side edges.

          A still simpler and more precise placing of the covering parts is achieved when the inner edge segment of the  
15   first covering part and the outer edge segment of the second covering part run substantially transversely of the visual side of the relevant covering part.

          In order to enable the realization of a form-fitting connection between the covering parts, the groove and the  
20   tongue preferably each form profiles complementary to at least one of the associated edge segments. This prevents clearance in the connection without the tension-free character thereof being lost.

          In order to achieve the most even possible movement  
25   during laying of the covering parts, the at least partly curved profile preferably forms a segment of a circle.

          According to a second aspect of the invention, the other edge segments define a gap in the mutually connected position of the covering parts. This achieves that possible  
30   expansion of the covering parts as a result of heat or moisture does not result in the connection bulging outward.

          In order to simplify still further the placing of the covering parts against each other, and thereby the

realization of the connection, a chamfered surface is preferably defined between the visual side and the side edge of at least one of the covering parts. The visual side hereby also acquires the appearance of a traditional plank floor.

5           When each covering part has two parallel step-like side edges, the one of which is embodied with the protruding backing side with groove and the other with the overhanging visual side with tongue, they can be connected on either side to adjoining covering parts.

10           Each covering part can also have two mutually parallel end edges which enclose an angle with the side edges and which are provided with secondary coupling elements, so that a plurality of covering parts can be laid mutually in line. A coupling of the end edges which is easily combined  
15 with the coupling of the side edges is obtained when the two end edges also take a step-like form such that the one covering part has a protruding backing side and the other covering part has an overhanging visual side, the secondary coupling element of the one covering part is a recess formed  
20 on the top of the protruding backing side, and the secondary coupling element of the other covering part is a protrusion formed under the overhanging visual side.

          Each covering part can be constructed from a relatively thick base layer forming the backing side and,  
25 connected thereto, a top layer forming the visual side, wherein the coupling elements are formed in the base layer. The cost of the covering can be limited by making use of a base layer which is not visible and can thus be manufactured from a relatively inexpensive material such as MDF or HDF. A  
30 material can moreover be chosen for this purpose in which the coupling elements can be formed with great accuracy and dimensional stability.

In order to give the covering a "luxurious" appearance, according to a third aspect of the invention the top layer is formed from a high-quality material, in particular a high-grade type of wood such as oak. The effect  
5 hereof is enhanced still further when the top layer has a thickness of at least 1 mm, preferably at least 2.5 mm and most preferably in the order of 4 mm. such a thick top layer, just as solid wood floor parts, can be regularly sanded during its lifespan without the base material becoming  
10 visible.

The invention also relates to a covering part intended for use in a covering as described above.

Finally, the invention relates to a method for mutually connecting in rapid and simple manner at least two  
15 such covering parts, at least one of which is already arranged on a ground surface. The method according to the invention comprises the steps of orienting a side edge of the second covering part for connecting to the first, already arranged covering part substantially parallel to a free side  
20 edge of the first covering part, moving the second covering part at a distance above the ground surface to the side edge of the first covering part, rotating the second covering part about an axis parallel to the side edge thereof, placing the tongue of the second covering part at an angle into the  
25 groove of the first covering part and, with forming of the connection, lowering the second covering part onto the ground surface by rotating it in the opposite direction. A strong and reliable connection can thus be brought about with a simple rotation movement, wherein no force need be exerted on  
30 the covering parts, and the use of additives such as lubricant is not required.

Because the formed connection is tensionless, the second covering part can, after connection thereof, be

displaced parallel to the side edge relative to the first covering part. It can thus be carried easily to a desired position.

In order to form rows of covering parts that fit  
5 together, it is possible after the first and second covering parts have been mutually connected to arrange a third covering part in line with the second covering part, which third covering part is attached by connecting a side edge thereof to the first covering part, and an end edge thereof  
10 to the second covering part. A relatively large area can thus be covered very quickly.

The invention will now be elucidated on the basis of an exemplary embodiment, wherein reference is made to the annexed drawing, in which:

15 Fig. 1 shows a schematic perspective view of a part of a covering according to the invention arranged on a ground surface,

Fig. 2 shows a cross-section along line II-II in fig. 1, wherein the connection of the side edges of two adjoining  
20 covering parts can be seen in the fitted situation,

Fig. 3 shows a cross-section in the same direction of two adjoining covering parts during connection thereof,

Fig. 4 is a side view according to arrow IV in fig. 1, wherein the connection of the end edges of two covering  
25 parts lying mutually in line can be seen in the fitted situation, and

Fig. 5 is side view in the same direction of two adjoining covering parts during connection thereof.

A covering 2 arranged on a ground surface 1 consists  
30 of a number of covering parts 4 laid in successive rows 3 on the ground surface (fig. 1). Each covering part 4 has two parallel, relatively long side edges 5, 6, in addition to two likewise parallel, relatively short end edges 7, 8. End edges



7, 8 enclose an angle with side edges 5, 6, here a right angle.

Covering parts 4 in adjoining rows 3 of covering 2 are connected to each other along their side edges 5, 6, while covering parts 4 in the same row 3 are connected to each other along their end edges 7, 8. Co-acting coupling elements 9, 10 are formed for this purpose on side edges 5, 6 (fig. 2), while end edges 7, 8 are provided with co-acting secondary coupling elements 11, 12 (fig. 4). These two pairs of coupling elements 9, 10 and 11, 12 respectively are adapted to form a force-transmitting and form-fitting, tensionless connection between said edges 5, 6 and 7, 8 respectively.

Each covering part 4 has a backing side 13 directed toward ground surface 1 and a visual side 14 remote therefrom. In the shown exemplary embodiment each covering part is embodied as laminate with a relatively thick base layer 15 of a less high-grade material, such as MDF or HDF, and a top layer 16 of a higher grade material, for instance oak. In the shown exemplary embodiment top layer 16 has a thickness of about 4 mm, while the base layer 15 is about 12 mm thick, so that the total thickness of covering part 4 amounts to about 16 mm. Covering part 4 could optionally be further provided on the backing side with an underlay (not shown here) of a damping or insulating material.

In the shown exemplary embodiment the side edges 5, 6 of covering parts 4 each take a step-like form, and have an inner edge segment 5i, 6i respectively and an outer edge segment 5o, 6o respectively. The backing side 13 thus protrudes along the one side edge 5, while the visual side 14 overhangs along the other side edge 6. It should be borne in mind here that, although in fig. 2 and 3 the side edges 5, 6 form part of two different covering parts 4, each covering

part 4 has two of these differently embodied side edges 5, 6. The same applies for the end edges 7, 8 to be discussed below.

The (primary) coupling elements 9, 10 along side edges 5, 6 of covering parts 4 form a kind of "tongue and groove" connection. The first coupling element 9 herein takes the form of a groove which is formed in the upper surface 17 of the protruding part of backing side 13. The second coupling element 10 is formed by a tongue which protrudes out of the lower surface 18 of the overhanging part of visual side 14. Both coupling elements 9, 10 are here formed integrally with covering part 4 in base layer 15. In the shown exemplary embodiment the groove 9 undercuts the inner edge segment 5i, while tongue 10 protrudes beyond outer edge segment 6o. In this manner the covering parts 4 are fixed transversely of their plane in the fitted situation.

Groove 9 and tongue 10 have a corresponding profile form and, together with the adjoining edge segments 5i, 6o and surfaces 17, 18, result in a form-fitting connection. The distance between the outer edge segment 5o and the outermost undercut point of groove 9 is however smaller than the distance between the inner edge segment 6i and the outermost point of tongue 10, so that a space 24 is defined between edge segments 5o and 6i in the fitted situation of the covering parts. Expansion of the base material 15 can hereby be absorbed without this resulting in deformation on the visual side 14.

The upper side 19 of groove 9 and the underside 20 of tongue 10 co-acting therewith, which together form the major part of the contact surface, have a curved profile to enable mutual connection of covering parts 4 by means of a rotation movement. In the shown exemplary embodiment these two curved surfaces take the form of a segment of a circle. In respect

of the rotating insertion movement, the undercut 21 of groove 9 and the upper side 22 of tongue 10 protruding beyond edge segment 60 further take an inclining form relative to the plane of covering parts 4. The corners 23 between the visual 5 side 14 and side edges 5, 6 are also chamfered, whereby covering parts 4 can be readily positioned for the connection to each other.

The secondary coupling elements 11, 12 along end edges 7, 8 of covering parts 4 form a kind of hook 10 connection. The one secondary coupling element 11 is herein formed by a groove which is recessed into the upper surface 25 of the protruding part of backing side 13. The second secondary coupling element 12 takes the form of a protrusion on the lower surface 26 of the overhanging part of visual 15 side 14. Both these secondary coupling elements 11, 12 are also formed integrally with covering part 4 in base layer 15.

Recess 11 and protrusion 12 once again have a corresponding profile form, so that here too a form-fitting connection is obtained. In order to simplify connection of 20 end edges 7, 8, recess 11 and protrusion 12 are further provided with chamfered edges, whereby they are self-centring.

For the purpose of laying a covering part 4 on the ground surface and connecting thereof along side edge 6 to 25 the side edge 5 of a covering part 4 already laid in a preceding row 3, the covering part 4 for laying is first held parallel to the already laid part 4. It is then rotated about an axis parallel to side edges 5, 6, whereby tongue 10 is oriented obliquely toward groove 9. This covering part 4 is 30 subsequently placed with its chamfered corner 23 close to or against the corner 23 of the already laid part 4, and then rotated back again on the same axis, wherein the curved underside 20 of tongue 10 slides over the curved upper side

19 of groove 9 until the upper surface 22 of tongue 10 rests against the surface 21 of groove 9.

When a subsequent covering part 4 must be laid in a row 3 where a covering part 4 has already been laid, it is first positioned with its corner 23 against the corner 23 of a covering part 4 in a preceding row 3 in the manner described above. The thus positioned covering part is then displaced parallel to side edges 5, 6 until its end edge 8 reaches the end edge 7 of the covering part 4 already laid in the same row 3. Covering part 4 is subsequently rotated downward, wherein its tongue 10 drops into the groove 9 of the covering part 4 laid in the preceding row 3, and its protrusion 12 drops into the recess 11 of the covering part 4 already laid in the same row 3. The new covering part 4 is thus hereby fixed simultaneously in longitudinal and in transverse direction.

This covering part 4 can otherwise also be connected first to the covering part 4 in the preceding row 3, and then be displaced in the connected position to the end edge 7 of the preceding covering part 4 in its row 3. Here the new covering part 4 can then be rotated upward again to allow protrusion 12 to pass over end edge 7, whereafter it can be rotated back again. These movements are possible because all connections between side edges 5, 6 and between end edges 7, 8 are tensionless according to the invention.

The invention thus makes it possible to provide a large area with a form-retaining covering in relatively short time and with little effort. In addition, the covering can also be removed again at a later time in rapid and simple manner. Furthermore, owing to the laminated character with a relatively thick top layer of high-quality material the covering has a luxurious appearance, while it can nonetheless be manufactured at relatively low cost.

Although the invention is elucidated above with reference to one exemplary embodiment, it will be apparent that the invention is not limited thereto. The tongue and groove whereby the side edges are connected could thus take a different form, for instance with only partly curved surfaces, or surfaces with a varying radius of curvature. The undercut and the protruding part of the tongue could also be formed differently. In addition, the tongue and the groove do not have to extend over the whole length of the covering parts. Different variants can also be envisaged for the connection of the end edges. It is for instance possible to envisage a number of studs and holes instead of coupling elements over the whole width of the covering parts. Finally, it is also possible to envisage the covering being arranged on a surface other than a floor, for instance a wall.

The scope of the invention is therefore defined solely by the appended claims.